

## Appendix D

### TEMP Format and Content

#### D-1. Part I—System Introduction

*a. Mission description.* Reference the MNS, Capstone Requirements Document (CRD) (if applicable), C4ISP, and ORD. Briefly summarize the mission need described therein. Specifically—

- (1) Define the need in terms of mission, objectives, and general capabilities.
- (2) Summarize from paragraph 2, MNS.
- (3) Describe the natural environment in two aspects; logistically and operationally. Summarize from paragraph 4, MNS.
- (4) For non-tactical C4/IT programs, system capabilities are detailed in paragraph 2 and 4 of the MNS and part 1, section 4 of the System Decision Paper (SDP). Functional process improvement is detailed in chapter 3 of the MNS or part 2, section 1 of the SDP.

(5) Include a description of the operational and logistical environment envisioned for the system.

*b. System description.* Provide a brief description of the system design, to include the following items:

(1) Key features and subsystems, both hardware and software (such as integrated architecture, interfaces, security levels, and reserves), which allow the system to perform its required operational mission.

(2) Interfaces with existing or planned systems that are required for mission accomplishment. Address relative maturity, integration, and modification requirements for non-developmental items. Include interoperability with existing and/or planned systems of other DOD Components or allies. Provide a diagram of the operational, technical, and systems views of the integrated architecture.

(3) Critical system characteristics or unique training and logistical support concepts resulting in special test and analysis requirements (for example, post deployment software support; hardness against nuclear effects; resistance to countermeasures; resistance to reverse engineering/exploitation efforts (anti-tamper); development of new threat simulations, simulators, or targets).

(a) For MS B summarize from the ORD or development specification, if available.

(b) For MS C and beyond summarize from the development specification.

(c) Include a description of what constitutes the Initial Operational Capability (IOC) and the final operational capability (FOC) for the system.

(4) Non-tactical C4/IT programs.

(a) Key features of the total system are identified in the Defense Information Infrastructure (DII) Common Operating Environment (COE), or section 3 of the System Specification (DI-CMAN-80008A), as applicable.

(b) Interfaces are identified in chapter 4-C of the MNS, or section 3.2 of the optional User Functional Description (UFD), and section 3 of the System Specification, or in section 3 of the Interface Requirements Specification (DI-MCCR-80026A), as appropriate.

(c) Unique system characteristics are identified in chapter 4-A of the MNS.

*c. System threat assessment.* Reference the system threat assessment and summarize the threat environment described therein as follows:

(1) Summarize the operational threat environment from paragraph 4a, STAR, and the system specific threat from paragraph 4e, STAR.

(2) Include the threat at IOC, follow-on—at IOC plus 10 years, and the reactive threat from paragraph 4e and 4f, STAR, if applicable. If the other sections of the TEMP are unclassified, then keep this section unclassified

(3) For non-tactical C4/IT programs, this is not applicable for IT systems unless they are developed to counter a specific threat.

*d. Measures of Effectiveness and Suitability (MOE/MOS).* List the performance (operational effectiveness and suitability) capabilities identified as required in the ORD. The capabilities identified in table D-1 are not intended to represent all capabilities related to the MOE and MOS. MOE and MOS should be identified to ensure that the TEMP adequately establishes the needed basis for T&E of the system's operational effectiveness and suitability. The critical operational effectiveness and suitability parameters and constraints must crosswalk to those used in the AoA, and include manpower, personnel, training, software, computer resources, infrastructure requirements, transportation (lift), compatibility, Army and/or Joint interoperability and integration, Information Assurance (IA), Electromagnetic Environmental Effects and Spectrum Supportability. Focus on operational capabilities, not design specifications (such as, weight and size). Limit the list to critical metrics that apply to capabilities essential to mission accomplishment. Include and clearly identify all KPP. For each listed parameter, provide the threshold and the objective values from the ORD and the ORD reference. If the system evaluator determines that the required capabilities and characteristics contained in the ORD provide insufficient measures for an adequate evaluation and OT, the system evaluator proposes additional

measures through the IPT process. Upon receipt of such a proposal, the ORD approval authority will establish the level of required performance characteristics. Specifically—

- (1) Summarize from the ORD paragraphs 4, 5, and 6.
- (2) For ACAT III programs not designated for OSD T&E oversight, it is sufficient to reference the ORD.
- (3) Non-tactical C4/IT programs.
  - (a) In cases when the optional UFD is used, operational requirements are amplified in the UFD, or in sections 3.5.2 and 3.7–3.12 of the Software Requirements Specification (DI-MCCR–80025A).
  - (b) For systems using accelerated techniques and automated tools, use the ORD and Software Requirements Specification.

**Table D–1**  
**Measures of effectiveness and suitability**

Operational requirement	Parameter	ORD threshold	ORD objective	ORD reference
Mobility	Land Speed** Miles per hour on secondary roads **KPP	xx miles per hour	xx miles per hour	Paragraph xxx
Firepower	Accuracy Main Gun Probability of hit/stationary platform/stationary target	xxx probability of hit @ xxx range	xxx probability of hit @ xxx range	Paragraph xxx
Interoperability	Interoperable with Current and Planned Secure Voice and Data Communications Systems ** (KPP)	Meet 100% of the critical Top Level Information Exchange Requirements	Same as threshold	4(b)
Supportability	Reliability Mean Time Between Opn'tl Mission Failure	xxx hours	xxx hours	Paragraph xxx

*e. Critical Technical Parameters (CTP).*

(1) List in a matrix format (see table D–2) the critical technical parameters of the system (including software maturity and performance measures) that will be evaluated (or reconfirmed if previously evaluated) during the remaining phases of developmental testing. Include the system interoperability criteria, maturity criteria, and performance exit criteria necessary for operational test readiness certification. CTP are derived from the ORD, critical system characteristics and technical performance measures and should include the parameters in the acquisition program baseline. CTP are measurable critical system characteristics that, when achieved, allow the attainment of operational performance requirements. They are not ORD requirements. Rather, they are technical measures derived from ORD requirements. Failure to achieve a critical technical parameter should be considered a reliable indicator that the system is behind in the planned development schedule or will likely not achieve an operational requirement. Limit the list of critical technical parameters to those that support critical operational requirements. The system specification is usually a good reference for the identification of critical technical parameters.

(2) Next to each technical parameter, list a threshold for each stage of development. Developmental test events are opportunities to measure the performance of the system as it matures. For most technical parameters, the listed thresholds should reflect growth as the system progresses toward achieving its ORD requirements. Also, list the decision supported after each event to highlight technical performance required before entering the next acquisition or operational test phase.

(3) Ensure technical parameters are included for technical interoperability.

(4) Software critical technical parameters will comply with the latest version of the Joint Technical Architecture-Army (JTA–A) including language, architecture, interfaces, supportability, security levels, time, memory, and input/output reserves.

(5) At MS B, the initial TEMP is not expected to contain detailed requirements. The TEMP update in support of MS C should include detailed values.

**Table D-2**  
**Critical technical parameters**

Supported operational requirement <sup>1</sup>	Technical parameter	Developmental stage event	Threshold value	Decision supported
In most cases a measure of effectiveness or suitability from paragraph 1.d	Technical measure(s) derived to support operational requirement	Developmental stage events (Described in TEMP Part III) designed to measure system performance against technical parameters.	Minimum value required at each developmental event. Most parameters will show growth as the system progresses through testing. Final value should reflect level of performance necessary to satisfy the operational requirement.	May be any decision marking the entrance into a new acquisition phase or may be a readiness for operational test decision.
Example: Main Gun Probability of Hit, 94% at 1,500 meters (ORD para. xxx.x)	Example: Auxiliary sight Boresight accuracy	Example: System Demo Test-Accuracy Test Prod Readiness Test-Accuracy Prod Qual Test	Example: +/- 5 mils +/- 3 mils +/- 1 mil	Example: Milestone B MS C (Low Rate Initial Production Decision) FRP DR

Notes:

<sup>1</sup> Include ORD reference.

(6) For tactical C4I/IT non-OSD T&E oversight systems and when intra-Army interoperability is identified as an operational requirement, there should be a measurable critical system intra-Army interoperability characteristic, in order to complete required intra-Army interoperability certification testing. Preferably, this interoperability characteristic should include at least one CTP.

(7) Non-tactical C4/IT programs.

(a) In addition to the references listed above, also reference section 3.6 of the Software Specification (DI-MCCR-80025A), as applicable.

(b) The CTP table for IT programs is similar in format to the CTP table for materiel systems with column headings and descriptions as follows:

- Critical Technical Parameters are obtained from the software specification and other related documents. For systems using accelerated techniques and automated tools, critical technical parameters are derived from the System/Subsystem Specifications and its versions transitioning to become the optional UFD.
- Reference the source from which the parameter and value is derived.
- Total events.
- Technical Objective for each test event.
- Location.
- Schedule—the fiscal quarter when the test will be initiated.
- Decision Supported.
- Demonstrated Value.

## **D-2. Part II—Integrated Test Program Summary**

### *a. Integrated Test Program Schedule.*

(1) As illustrated in figure D-1 (can be a fold-out chart), display the integrated time sequencing of the critical T&E phases and events, related activities, and planned cumulative funding expenditures by appropriation.

(a) The integrated test program schedule will be divided into seven major areas: Program Milestones; Program Acquisition Events; Contract Release and Awards; Program Deliverables; Developmental Tests; Live Fire Tests; Operational Tests; and Program Funding.

(b) The schedule must cover the acquisition and T&E program through full operational capability.

(2) Include event dates such as MS decision points; operational assessments, test article availability; software version releases; appropriate live fire test and evaluation, and operational and developmental test events; system evaluation reports, long lead items dates, low-rate initial production deliveries; full-rate production deliveries; IOC; FOC; and statutorily required reports such as the Live-Fire T&E Report and Beyond-LRIP Report.

(3) A single schedule should be provided for multi-Service or Joint and Capstone TEMPs showing all DOD Component system event dates.

(4) For ACAT III programs not on the OSD T&E Oversight List, it is not critical to adhere to the exact format of figure D-1. A chart showing the program MSs and the planned tests is adequate.

(5) For tactical C4I/IT non-OSD T&E oversight systems, identify the DT and OT events, if applicable, that will be used to support the CTSF testing and the HQDA (CIO/G-6) (or delegated Milestone Decision Authority) intra-Army interoperability certification in support of acquisition decision reviews, operational testing, and materiel release entrance criteria. DT and OT results can also be leveraged by the JITC to facilitate the issuance of a joint interoperability certification.

(6) For non-tactical C4I/IT programs, information/data should be obtained from the master schedule, section F, of the Management Plan (MP).

(7) Funding Expenditures: Provide annual amounts allocated or requested/estimated (outside POM funding years) for RDT&E and production accounts. Further identify projected expenditures, obtained from MRTFB Commanders, for the use of MRTFB ranges and facilities that come from within the program RDT&E budget line.

*b. Management.*

(1) Discuss the T&E responsibilities of all participating organizations (that is, developers, testers, evaluators, and users), to include the following:

(a) Identify T&E WIPT members and their role (see table D-3). Reference the T&E WIPT Charter for specific responsibilities. (See AR 73-1 and chap 2 of this pamphlet.) The T&E WIPT Charter must be included as a reference in annex A, the bibliography of the TEMP.

(b) For ACAT III programs not designated for OSD T&E oversight, it is sufficient to reference the T&E WIPT Charter.

(2) Provide the date (fiscal quarter) when the decision to proceed beyond-LRIP is planned. LRIP quantities required for operational test must be identified for DOT&E approval prior to MS C for ACAT I programs and other ACAT programs designated for DOT&E OT oversight). The date for the BLRIP decision is found in the Integrated Program Summary (IPS), Acquisition Strategy Report.

(a) The quantity of LRIP items needed for IOT is recommended by ATEC in coordination with the PM.

(b) The quantity of items needed for IOT for all other ACAT programs are included as recommended by ATEC.

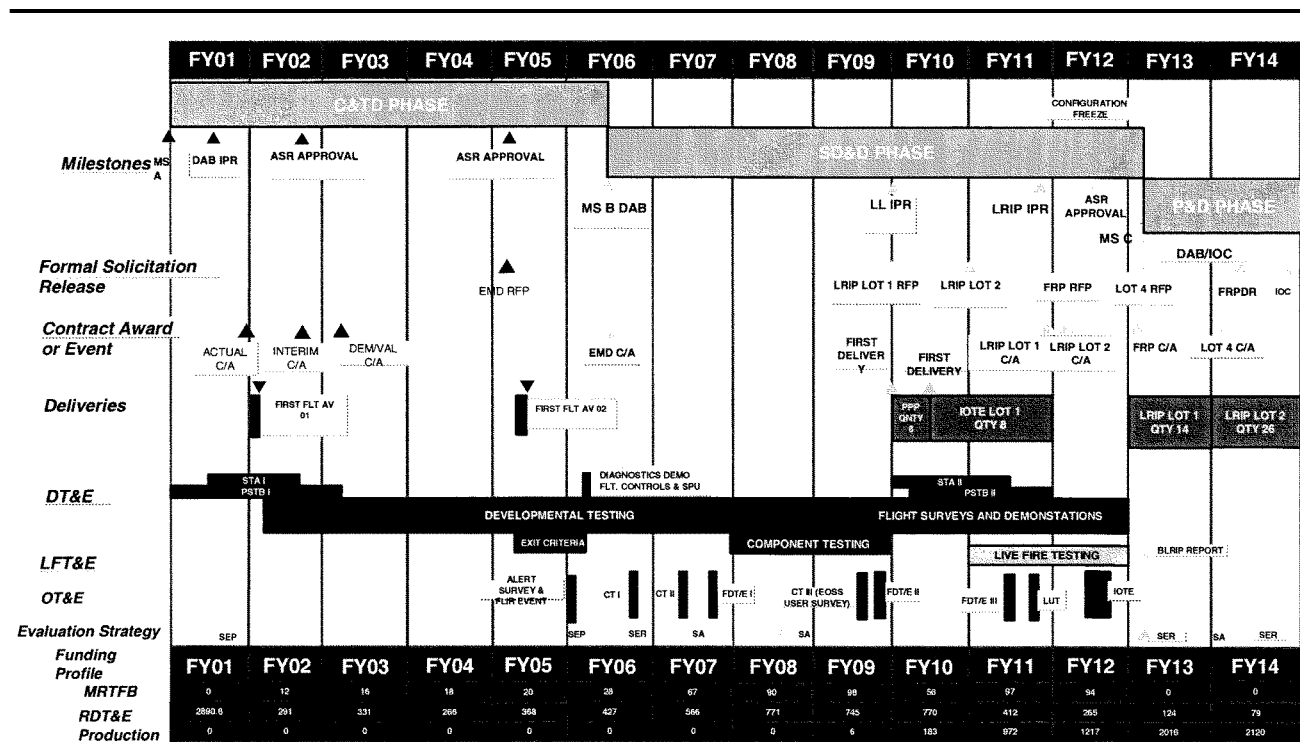


Figure D-1. Integrated Test Program Summary

**Table D-3**  
**T&E WIPT membership and roles**

T&E WIPT member	T&E WIPT role
Program Manager (any given system)	T&E WIPT chair
TRADOC proponent school	System Combat Developer
Army Evaluation Center (AEC)	Independent System Evaluator
Developmental Test Command or other DT activity	System Developmental Tester
Operational Test Command or other OT activity	System Operational Tester
ASA(ALT) ILS	Independent Logistician
Survivability & Lethality Analysis Directorate, Army Research Laboratory (SLAD, ARL)	Survivability/Lethality Analyst
Joint Spectrum Center (JSC)	Electromagnetic Environmental Effects and Spectrum Management
Threat Integrator	Threat Integrator
TRADOC Training Proponent	System Trainer
ASA(ALT)	HQDA Representative
HQDA (CIO/G-6)	Same as above
ODUSA(OR)	Same as above
ASA(ALT) ILS	Same as above
DCS, G-8	Same as above
DCS, G-4	Same as above
DCS, G-2	Same as above
DCS, G-1	Same as above
Air Force Operational Test and Evaluation Center (AFOTEC)	Participating Service operational test representative if T&E WIPT has multi-Service participation.
Marine Corps Operational Test and Evaluation Agency (MCOTEA)	Same as above
Operational Test & Evaluation Force (Navy) (OPTEVFOR)	Same as above
Participating Service User Representative	Additional combat developer input
Associate Members (as appropriate)	

(3) Identify and discuss any operational issues and vulnerability and lethality Live Fire Test requirements that will not be addressed before proceeding beyond LRIP.

(4) Identify the technological maturity of the technology being designed into the system and components/parts/subsystems. State the proven methods of test and calibration associated with test to ensure that the system and components/parts/subsystems are testable in operation and support environments. State any deficiencies and how the deficiencies will be resolved prior to OT and production.

(5) For tactical C4I/IT non-OSD T&E oversight systems, identify the specific intra-Army interoperability responsibility of the PM/System Manager; HQDA (DCS, G-3); TRADOC System Manager (TSM); CTSF; CECOM's Software Engineering Center; Digital Integration Laboratories; and other organizations, as applicable. In addition, list the intra-Army interoperability exit criteria for the upcoming acquisition decision review(s).

(6) Provide the proposed or approved performance exit criteria to be assessed at the next acquisition decision. For a TEMP update, generated by an acquisition program baseline breach or significant change, provide the Acquisition Decision Memorandum-approved exit criteria from the current phase's beginning milestone decision, or any revised ones generated by the breach or the significant change.

(7) For non-tactical C4I/IT programs, provide the date (fiscal quarter) when the decision to proceed to FRP DR interoperability certification is planned. If the system is being developed through an incremental acquisition strategy, provide the date (fiscal quarter) when the decision to proceed to FRP DR interoperability certification is planned and briefly outline the extent of incremental deployment activities prototype, test bed sites, and so forth) prior to FRP DR interoperability certification. The extent of incremental deployment before IOT&E must be identified prior to MS C for OSD and Army MAIS systems.

### D-3. Part III—Developmental Test and Evaluation Outline

*a. Developmental Test and Evaluation Overview:* Explain how developmental test and evaluation will verify the status of engineering and manufacturing development progress; verify that design risks have been minimized; anti-tamper provisions have been implemented (required security designs and security controls were implemented); substantiate achievement of contract technical performance requirements; and certify readiness for dedicated operational test. Specifically—

(1) Identify any technology/subsystem that has not demonstrated its ability to contribute to system performance and ultimately fulfill mission requirements.

(2) Identify the degree to which system hardware and software design has stabilized so as to reduce manufacturing and production decision uncertainties.

(3) Assess the degree to which system software has stabilized so as to reduce software rework required.

(4) Identify how system HWIL, simulations, training simulators, flight mission simulators, and the system test support base will be used to support operational testing, wartime problem resolution, and system upgrades through the life cycle of the system.

(5) For tactical C4I/IT non-OSD T&E oversight systems, address how the intra-Army interoperability CTP(s) is being verified for technical performance requirements and how it can be used to certify interoperability readiness for dedicated OT.

(6) For non-tactical C4/IT programs, show how the metrics in each phase relate to those in previous and subsequent phases.

*b. Future Developmental Test and Evaluation:* Discuss all remaining developmental test and evaluation that is planned, beginning with the date of the current TEMP revision and extending through completion of production. Whenever possible, DT results should be made available to the JITC in an attempt to minimize the cost of joint interoperability testing. Place emphasis on the next phase of testing. For each phase, include—

(1) Configuration Description. Summarize the functional capabilities of the system's developmental configuration and how they differ from the production model.

(2) Developmental Test and Evaluation Objectives. State the test objectives for this phase in terms of the critical technical parameters to be confirmed, to include anti-tamper characteristics. Identify any specific technical parameters that the milestone decision authority has designated as exit criteria and/or directed to be demonstrated in a given phase of testing.

(3) Developmental Test and Evaluation Events, Scope of Testing, and Basic Scenarios. Summarize the test events, test scenarios and the test design concept. Quantify the testing (for example, number of test hours, test events, and test firings). List the specific threat systems, surrogates, countermeasures, component or subsystem testing, and testbeds that are critical to determine whether or not developmental test objectives are achieved. As appropriate, particularly if an agency separate from the test agency will be doing a significant part of the evaluation, describe the methods of evaluation. List all models and simulations to be used to evaluate the system's performance, explain the rationale for their credible use and provide their source of verification, validation and accreditation (VV&A). Describe how performance in natural environmental conditions representative of the intended area of operations (for example, temperature, pressure, humidity, fog, precipitation, clouds, electromagnetic environment, blowing dust and sand, icing, wind conditions, steep terrain, wet soil conditions, high sea state, and storm surge and tides) and interoperability with other weapon and support systems, as applicable, to include insensitive munitions, will be tested. Describe the developmental test and evaluation plans and procedures that will support the JITC/DISA joint interoperability certification recommendation to the Director, Joint Staff (J-6) in time to support the FRP DR. Joint and combined interoperability certification will be directly coordinated through the Army Participating Test Unit (APTU) at the CECOM Software Engineering Center. For Army-approved systems, discuss the developmental test and evaluation plans and procedures that will support the CTSF interoperability certification recommendation to the HQDA (CIO/G-6) or TEMP approval authority. Topics addressed in this section can include—

(a) Early developmental tests that will be performed to mitigate technical risks in the program that are defined in the Risk Assessment, annex D, Integrated Program Summary.

(b) Identification of developmental tests that will be used to demonstrate that the test item is safe and that the technical manuals are verified and validated and ready for use in a follow-on or concurrent operational test.

(c) Identification of the test, usually the Production Qualification Test (PQT), that will be performed to validate that the system meets the system's technical performance requirements that are usually contractually mandated in a specification.

(d) The developmental test(s) that will be used to certify the system is ready for Initial Operational Test (IOT) and who has responsibility for execution.

(e) If applicable, testing to address conventional weapon effects, electromagnetic and environmental effects (E<sup>3</sup>), electronic countermeasures (ECM), electronic counter-countermeasures (ECCM), initial nuclear weapons effects, advanced technology survivability, and NBC contamination survivability (reference DODI 5000.2).

(f) Identification of the developmental test plans and strategy to prove or validate the manufacturing process (reference DODI 5000.2).

(4) The following areas (specifically the description and objective) of each of the developmental tests addressed in Future DT&E.

- (a) Reliability, Availability, and Maintainability
- (b) Electromagnetic Compatibility and Radio Frequency Management
- (c) Human Systems Integration/MANPRINT
- (d) Environmental Safety and Occupational Health (ESOH)
- (e) Integrated Logistical Support. A Logistics Demonstration (LD) is required for all acquisition programs unless waived. (See AR 700–127.) The waiver, if approved, will be documented in part II, section 2 of the TEMP, with the approval document referenced in annex A, bibliography of the TEMP.
- (f) Discuss the indicators that will be used to determine software status and evaluate progress toward software maturity in support of key decision points, particularly for software intensive systems. Show how the indicators in each phase relate to those in previous and subsequent phases.
- (g) Include a discussion of any test databases and/or remote terminal emulators to be used and their relationship to the objective system environment.

(5) For non-tactical C4/IT programs, the following software tests must be addressed, with specific test items listed below each test type:

(a) *Software Development Test (SDT)*.

- Configuration Description (of test item).
- Test and Evaluation Objectives.
- Events, Scope of Testing, and Basic Scenarios.
- Limitations.

(b) *Software Qualification Test (SQT)*.

- Configuration Description (of test item).
- Test and Evaluation Objectives.
- Events, Scope of Testing, and Basic Scenarios.
- Limitations.

(6) Limitations. Discuss the test limitations that may significantly affect the evaluator's ability to draw conclusions, state the impact of these limitations, and explain resolution approaches.

(7) For tactical C4/IT non-OSD T&E oversight systems, describe the set of approved CTSF test requirements, criteria for intra-Army interoperability testing, and DT events that will be used to satisfy both intra-Army and joint interoperability certification test requirements. Identify future DT that will address the remaining intra-Army interoperability requirements.

#### **D–4. Part IV—Operational Test and Evaluation Outline**

a. *Operational test and evaluation overview.*

(1) The primary purpose of operational testing and system evaluation is to determine whether systems are operationally effective, suitable, and survivable for the intended use by representative users in a realistic environment before production or deployment.

(2) The TEMP will show how program schedule, test management structure, and required resources are related to the system evaluation strategy. Operational testing will provide data to support the system evaluation and will be conducted with typical users in an environment as operationally realistic as possible, including threat representative opposing forces and the expected range of natural environmental conditions.

(3) Summarize the entire OT&E program. The purpose of the overview is to give a quick, concise look at the overall system evaluation strategy and the test program and M&S to support it, explaining the many interrelationships and opportunities to conduct continuous evaluation (CE). Topics that can be addressed include—

- (a) Description of the overarching evaluation model being used.
- (b) Definitions of mission effectiveness, suitability, and survivability.
- (c) Identification of mission tasks that the system is expected to enhance.
- (d) Identification of the system function capabilities that the system is expected to possess.
- (e) Key technical and operational characteristics of the system that will be the focus of the system evaluation.
- (f) Identification of contractor and developmental tests that will be used as part of a system evaluation or assessment.
- (g) Identification of models and simulations that will be used to supplement and extend operational testing as part of a system evaluation or assessment.

(h) Identification of completed and planned Battle Lab Experimentation to be used in the system evaluation. These experiments when planned and executed in coordination with ATEC may serve to reduce future operational test requirements.

(i) Sources of data, baseline comparisons, general analysis scheme, test data, and AoA linkage.

(4) For tactical C4I/IT non-OSD T&E oversight systems, address both the intra-Army and joint interoperability operational effectiveness issue(s) and criteria, if applicable. Moreover, ensure that entrance criteria for operational tests(s) address CTSF communications/data interfaces test results and the criteria for both intra-Army and joint interoperability.

*b. Critical operational issues and criteria (COIC).* List in this paragraph the approved COIC. COIC include operational effectiveness, suitability, and survivability issues that must be examined to evaluate/assess the system's capability to perform its mission.

(1) State the measures of effectiveness (MOEs) and measures of performance (MOPs). Define the data requirements for each MOE/MOP.

(2) Include the approved COIC in their entirety in the TEMP or as Attachment 2 including Issue, Scope, Criteria, and Rationale.

(3) Reference the COIC approval document in annex A, bibliography, of the TEMP.

(4) For tactical C4I/IT non-OSD T&E oversight systems, include, if appropriate, at least one intra-Army inter-operability operational effectiveness issue and criterion.

*c. Future operational test and evaluation.* For each remaining phase of operational test, separately address the following:

(1) *Configuration Description.* Identify the system to be tested during each phase, and describe any differences between the tested system and the system that will be fielded. Include, where applicable, software maturity performance and criticality to mission performance, and the extent of integration with other systems with which it must be interoperable or compatible. Characterize the system (for example, prototype, engineering development model, production representative or production configuration).

(2) *Operational Test and Evaluation Objectives.* State the test objectives, including the objectives and thresholds and critical operational issues, to be addressed by each phase of operational test and evaluation and the decision points supported. Operational test and evaluation that supports the FRP decision review will have test objectives, to include anti-tamper characteristics that interface with operations and maintainers, and that resolve all unresolved effectiveness, suitability, and survivability COI.

(3) *Operational Test and Evaluation Events, Scope of Testing, and Scenarios.* Summarize the scenarios and identify the events to be conducted, type of resources to be used, the threat simulators and the simulation(s) to be employed, the type of representative personnel who will operate and maintain the system, the status of the logistic support, the operational and maintenance documentation that will be used, the environment under which the system is to be employed and supported during testing, the plans for interoperability and compatibility testing with other United States/ Allied systems, the anti-tamper characteristics to be assessed in an operational environment and support systems as applicable. Identify planned sources of information (for example, developmental testing, testing of related systems, and M&S) that may be used by the operational tester to supplement this phase. Whenever models and simulations are to be used: Identify the planned M&S; explain how they are proposed to be used; and provide the source and methodology of the VV&A underlying their credible application for the intended use. If operational testing cannot be conducted or completed in this phase of testing and the outcome will be an assessment instead of an evaluation, this will clearly be stated and the reason(s) explained. Describe the operational test and evaluation plans and procedures that will support JITC/DISA (OSD T&E oversight and Joint systems) joint interoperability certification recommendation to the Director, Joint Staff (J-6) in time to support the FRP DR. Joint and combined interoperability certification will be specifically coordinated through the APTU at the CECOM Software Engineering Center. For Army approved systems, discuss the U.S. Army CTSF interoperability certification recommendation submitted to the HQDA (CIO/G-6).

(4) *Areas to address.* The following areas need to be addressed (specifically, the description and objective) of each of the operational tests addressed in this section.

(a) Human performance issues.

(b) Logistics support issues (readiness, reliability, availability, and maintainability) to include Test Measurement and Diagnostic Equipment (TMDE), Automatic Test Equipment (ATE), Test Program Sets (TPS), test and calibration interface devices, calibration equipment, calibration spheres and methods, and integrated diagnostics.

(c) Identify operational tests that will be conducted and the developmental tests that will provide source data for the system evaluation or assessment. When developmental tests are identified, subparagraph (6) Operational Test and Evaluation Events, Scope of Testing, and Scenarios, should define the data in general terms that will be taken from the developmental test for the system evaluation or assessment. This will ensure that the developmental testers, by their signature on the TEMP, have agreed to collect and provide that data to the system evaluator.

(d) Describe how models will be accredited for use in specific operational tests. The approval vehicle for accreditation is an Accreditation Plan as outlined in AR 5-11, Army M&S Management Program. Reference the Accreditation



Plan in annex A, bibliography of the TEMP. Part V of the TEMP, Test and Evaluation Resource Summary, will identify the resources necessary to perform the validation and/or accreditation.

(5) *Limitations.* Discuss the test and evaluation limitations including threat realism, resource availability, limited operational (military, climatic, and nuclear) environments, limited support environment, maturity of tested system, and safety that may impact the resolution of affected critical operational issues. Indicate the impact of the limitations on the ability to resolve critical operational issues and the ability to formulate conclusions regarding operational effectiveness, suitability, and survivability. Indicate the critical operational issues affected in parenthesis after each limitation.

(6) *For tactical C4I/IT non-OSD T&E oversight systems.* Identify remaining phases of OT and both intra-Army and joint interoperability operational effectiveness issue(s) and criteria that will be addressed. Describe the configuration of the future systems and the remaining intra-Army interoperability operational effectiveness issue(s) and criteria.

d. *Live fire test and evaluation (LFT&E).* This paragraph applies to those systems that are identified as a covered system or major munitions program as defined in Title 10, United States Code, section 2366. Do not address LFT&E in a separate annex.

(1) See also the Defense Acquisition Guidebook. Include a description of the overall LFT&E strategy for the system; critical LFT&E issues; required levels of system protection and tolerance to terminal effects of threat weapons and lethality; the management of the LFT&E program; live fire test and evaluation schedule, funding plans and requirements; related prior and future live fire test and evaluation efforts; the evaluation approach and shot-lines selection process; M&S strategy and VV&A; and major test and evaluation limitations for the conduct of live fire test and evaluation. Discuss, if appropriate, procedures intended for obtaining a waiver from full-up, system-level live fire testing (realistic survivability/lethality testing as defined in Section 2366, Title 10 USC) before entry into the System Development and Demonstration Phase. Live fire test and evaluation resource requirements (including test articles and instrumentation) will be appropriately identified in part V (Test and Evaluation Resource Summary) of the TEMP.

(2) Group all vulnerability/lethality testing (when applicable) under one paragraph to show how the vulnerability/lethality issue is being assessed through various tests and subtests. Such testing can include dedicated tests such as ballistic hull and turret testing. Subtests can include armor plate tests, penetration tests, as well as other tests that validate the vulnerability/lethality requirements of a program.

(3) Future LFT&E is discussed at the same level of detail as DT&E and OT&E. Discuss each Live Fire test phase, the configuration description, test objectives, scope of testing, and limitations.

(4) Include an LFT&E planning matrix that covers all tests within the LFT&E strategy, their schedules, the issues they will address and which planning documents proposed for submission to DOT&E for approval and which are proposed to be submitted for information and reviews only.

## **D-5. Part V—Test and Evaluation Resource Summary**

Provide a summary (preferably in table or matrix format) of all key test and evaluation resources, both Government and contractor, that will be used during the course of the acquisition program. The initial TEMP at program initiation should project the key resources necessary to accomplish demonstration and validation testing and early system assessment. The initial TEMP should estimate, to the degree known, the key resources necessary to accomplish developmental test and evaluation, live fire test and evaluation, and operational test and evaluation. These should include the Major Range and Test Facility Base (MRTFB), capabilities designated by industry and academia, and MRTFB test equipment and facilities, unique instrumentation, threat simulators, targets, and M&S. As system acquisition progresses, the preliminary test resource requirements will be reassessed and refined and subsequent TEMP updates will reflect any changed system concepts, resource requirements, or updated threat assessments. Any resource causing significant test limitations should be discussed with planned corrective action outlined. As a general rule, only address new high dollar resources, rather than a laundry list of readily available or inexpensive resources. The AST, specifically, the developmental tester and operational tester, should provide input specific to their requirements and indicate which requirements each tester identified. Specifically identify the following test resources with a table or matrix recommended for each.

a. *Test articles.* Identify the actual number of and time requirements for all test articles, including key support equipment and technical information required for testing in each phase by major type of developmental test and evaluation and operational test and evaluation. If key subsystems (components, assemblies, subassemblies or software modules) are to be tested individually, before being tested in the final system configuration, identify each subsystem in the TEMP and the quantity required. Specifically identify when prototype, engineering development, pre-production, or production models will be used.

b. *Test sites and instrumentation.* Identify the specific test ranges/facilities to be used for each type of testing. Compare the requirements for test ranges/facilities dictated by the scope and content of planned testing with existing and programmed test range/facility capability, and highlight any major shortfalls, such as the inability to test under representative natural environmental conditions. Identify instrumentation that must be acquired or developed specifically to conduct the planned test program. Clearly identify the test investment requirement to ensure test site instrumentation availability and capability. Describe how environmental compliance requirements will be met.

(1) Testing will be planned and conducted to take full advantage of existing investment in DOD ranges, facilities and other resources, wherever practical.

(2) In order for the Army to realize maximum value from its capital investment in test facilities, it is necessary that PEO/PMs coordinate developmental test requirements with the AST and specifically, the developmental tester from DTC. This should be accomplished early in the acquisition cycle, preferably prior to MS B. This coordination should facilitate the development of developmental testing requirements and determine the extent and nature of contractor services, if required. If DTC cannot conduct the DT (for example, scheduling does not permit), the PEO/PM has the authority to use contractor support. This decision and rationale will be documented in this paragraph of the TEMP.

*c. Test support equipment.* Identify test support equipment that must be acquired specifically to conduct the test program. Address only new test support equipment. This includes software test drivers, emulators, or diagnostics, if applicable, to support identified testing. Identify unique or special calibration requirements associated with this test support equipment.

*d. Threat representation.* Identify the type, number, availability, and fidelity requirements for all threat systems/simulators. Compare the requirements for threat systems/simulators with available and projected assets and their capabilities. Highlight any major shortfalls. Each representation of the threat will be subjected to validation procedures to establish and document a baseline comparison with its associated threat and to ascertain the extent of the operational and technical performance differences between the two throughout the simulator's life-cycle. Threat systems/simulators to be used in activities supporting milestone decisions must be validated and accredited for the specific application. Validation and accreditation procedures are to be documented in accordance with the Army Validation and Accreditation Plan. The resulting report should be cited in annex A, the bibliography of the TEMP. For non-tactical C4/IT programs, threat representation is generally not applicable.

*e. Test targets and expendables.* Identify the type, number, and availability requirements for all targets, flares, chaff, sonobuoys, smoke generators, and acoustic countermeasures, that will be required for each phase of testing. Identify any major shortfalls. Include threat targets for LFT lethality testing and threat munitions for vulnerability testing. High fidelity targets require the same validation and accreditation process as for threat systems and simulators. Results of this effort should be cited in annex A, the bibliography of the TEMP. Each threat target will be tailored to characteristics of interest, in order to establish and document a baseline comparison with its associated threat and to ascertain the extent of operational and technical performance differences throughout the threat target's life cycle. Identify the schedule impacts, if any, associated with test target development. For non-tactical C4/IT programs, test targets and expendables are not applicable.

*f. Operational force test support.* For each T&E phase, identify the type and timing of aircraft flying hours, ship steaming days, and on-orbit satellite contacts/coverage, and other critical operating force support required. Include size, location, and type unit of unit required.

*g. Simulation, models, and testbeds.* For each T&E phase, identify the system simulations required, including computer-driven simulation models and hardware/software-in-the-loop testbeds. Identify the resources required to validate and accredit their usage.

(1) Include only those simulations, models, and testbeds that will be used to extend testing and/or used in the system evaluation. This includes feeder models.

(2) Simulations, models, and test beds used solely for engineering purposes (not in support of and/or used in system evaluation). This includes feeder models.

(3) Simulations, models, and test beds used solely for engineering purposes (not in support of program decisions) do not need to be identified in this paragraph.

(4) Include all HWIL, simulations, flight mission simulators, systems used as test prototypes, training simulators, and other test assets essential to wartime problem identification and resolution, system change T&E, and sustainment.

*h. Special requirements.* Discuss requirements for any significant non-instrumentation capabilities and resources such as special data processing/databases, unique mapping/charting/geodesy products, extreme physical environmental conditions or restricted/special use air/sea/landscapes. Software resource requirements are found in the Computer Resources Life Cycle Management Plan (CRLCMP).

*i. Test and evaluation funding requirements.* Estimate, by fiscal year and appropriation line number (program element), the funding required to pay direct costs of planned testing. State, by fiscal year, the funding currently appearing in those lines (program elements). Identify any major shortfalls.

*j. Manpower/Personnel training.* Identify manpower/personnel and training requirements and limitations that affect test and evaluation execution.

## **D-6. Annexes and attachments**

*a. Annex A—Bibliography.*

(1) Cite in this section all documents referred to in the TEMP.

(2) Cite all reports documenting developmental, operational, and LFT&E.

*b. Annex B—Acronyms.* List and define all acronyms used in the TEMP.

*c. Annex C—Points of Contact.*

d. Attachment 1—Requirements/Test Crosswalk Matrix.

(1) The purpose of this annex is to provide a linkage among the AoAs, MOE, MOS, KPP, COI, and CTP, and then relate these items to specific test events for identification of data necessary to evaluate the system against the requirements. This crosswalk will consist of a foldout spreadsheet or matrix as shown in figure D–2.

(2) The linkage can be developed using any one of the categories to generate the association. Since the COI are usually the fewest in number, it may be easiest to begin with the COI and then develop the linkage with the other categories. The MOE/MOS column should reflect precisely the MOE/MOS table contained in Part I of the TEMP. The CTP column should also reflect precisely the CTP matrix in Part I of the TEMP.

COIs	AOA	MOE/MOS **KPP	CTPs	ORD (Ref Par)	EMD-DT	EMD-OT	96-98 Digitization Technical Tests	98 Digitization Customer test	CDS4 Technical Test	CDS4 Operational Test	Additional Testing
1. Is the OH-48X capable of conducting armed reconnaissance in the air cavalry unit?	Mission Performance	1) Mission Capable**	HOGE	5.c(1)a	x	x	x				
			VROC	5.c(1)b	x	x	x				
			Endurance Flight Time	5.c(1)c	x	x	x				
			HOGE at alternative MGW	5.c(1)d	x	x	x				
			Controllability	5.c(1)e	x	x	x		x	x	
			Dash airspeed	5.c(1)f	x	x	x				
			Slope landing	5.c(1)g	x	x					
			Max power rating	5.c(1)h	x	x	x				
	Target Accuracy Target Acquired	2) Visionics	Target acquisition, designation, and location	5.e	x	x	x	x	x	x	
		3) Avionics	Navigation capability	5.g(2)	x	x	x	x	x	x	
	Battlefield Information	4) Armament	Communications	5.g(3)	x	x	x	x	x	x	
				5.h	x	x	x	x	x	x	
		5) Interoperability **	Interoperability	DOD JTA	x	x	x	x	x	x	
		6) Countermeasures		5.i	x	x					
		7) Ballistic Protection		5.j							x
		8) NBC Survivability		5.m	x	x					
2. Can the Armed OH-48X be deployed to, and sustained in, an operational environment?	Mission/Day, Response Time	1) Transportability		5.l	x	x					
	Mission Completion Rate	2) RAM	MTBMAF	5.k(2)	x	x	x	x	x	x	
			Mission reliability (4 hr mission)	5.k(2)	x	x	x	x	x	x	
			MITR	5.k(2)	x	x	x	x	x	x	
			MR (AVIM)	5.k(2)	x	x	x	x	x	x	
			MR (AVUM)	5.k(2)	x	x	x	x	x	x	
		3) Human Factors		5.s	x	x	x	x	x	x	
3. Can the Armed OH-48X meet mission requirements in operational electromagnetic environments? (AI)	Mission Completion (E <sup>3</sup> ) Environment	1) E3	EMI/EMV	5.u	x	x	x	x			x

Figure D–2. Sample requirements/test crosswalk matrix

(3) The second part of the matrix should consist of all test events contained in the test strategy. For each test event, an X is placed in a box, provided data from that test will be used to satisfy the corresponding requirement.

e. Attachment 2. Reserved for full set of COIC, to include Issue, Scope, Criteria, and Rationale.

## Appendix E

### COIC Format and Content

#### E-1. Overview of critical operational issues and criteria

COIC are, by definition, those decision-maker key operational concerns (issues) with bottom line standards of performance (criteria), that, if satisfied, signify that a system is operationally ready to proceed to FRP.

a. Critical operational issues are those key decision-maker operational concerns that must be answered for the FRP DR to proceed. They are operationally oriented and not technology, cost, or politically focused. A typical set of COI is given below. Note that a system is considered operationally ready (effective, suitable, and survivable) to proceed to full production when the following operational concerns are answered affirmatively:

(1) Does the system satisfy the reasons for the operational requirement being established and an acquisition program initiated?

(2) Can the system accomplish its critical mission(s)?

(3) Can the system maintain trained preparedness in peacetime for critical mission(s)?

(4) Can the system be deployed when and where needed for critical missions?

(5) Can the system be sustained during combat and/or other critical operations? Note: This does not mean that there are always four or five COI. These concerns may be adequately addressed in one, three, or more COI as appropriate for a system. However, COI by their nature are few in number. Additionally, programs covered by the Defense Acquisition Guidebook require a COI for interoperability. One or more concerns may be covered in the criteria or may be considered not to be applicable for the system. In the latter case, the COIC development team must be prepared to justify such determination and address it in the COIC approval submission memorandum (see app F).

b. COIC criteria are bottom line standards of performance for satisfying a COI and are “show stoppers” if not satisfied for the FRP DR. If a shortfall exists for one or more of the COIC criteria at the FRP DR, convincing evidence (that is, other effectiveness, sustainability, and cost data, analyses, and resulting considerations along with review of program alternatives) must be provided for the decision authority to allow the program to proceed. Like the issues, the criteria are operationally oriented and not technology, cost, or politically focused. This does not mean that the criteria are operational test oriented, just that the criteria provide operationally relevant measures. While most criteria will be answered using multiple data sources including some form of operational test, some criteria, such as NBC contamination hardening, when a specific program objective, must depend on developmental test or simulation output data. Each critical operational issue will have at least one criterion.

*Note.* For systems on the OSD T&E Oversight List, the DOT&E provides the statutory Beyond LRIP (BLRIP) Report to SECDEF and Congress before the FRP DR. This report concludes whether the system is operationally effective, suitable, and survivable to enter production. If there are shortfalls in any COIC, any evidence that the system is still effective, suitable, and survivable must be provided to and considered by the DOT&E before this report is released.

c. The system of concern is the total operational system (see fig E-1) as a composite rather than any of its component parts. Simultaneously, the total system of interest may be a single system (for example, a truck with trailer) or an operational unit (for example, a team or platoon). This has several benefits, not the least of which is fewer issues. In addition, they are more relevant to operations than if focused on system components, and the potential for duplicate coverage is reduced.

d. The COIC structure (fig E-2) provides for each issue: a scope paragraph (conditions for evaluating the issue), its associated criteria, and a rationale section (basis for each criteria). Additionally, the structure provides a notes section including two standardized mandatory notes (the first addressing the total system focus and coverage of the criteria; the second addressing the pass/fail application of the COIC) and other system specific notes as needed. A third mandatory note (stating that COIC are based on initial requirements and will be updated prior to MS C) is included for COIC supporting the MS B TEMP. If this is a system for which MS C is also the FRP DR and the ORD requirements and COIC are still soft (such as, require update), then a point between MS B and C should be identified for ORD, COIC and TEMP update. As the structure indicates, the criteria are the instruments for judging whether an issue is satisfied (that is, achievement of all criteria results in a satisfied issue). This structure applies to COIC coordination, approval, and processing; TEMP content; and SEP content. COIC are coordinated, staffed, and approved as a stand-alone document. Chapter 4, figures 4-8 and 4-10, provides more details on the COIC coordination and submission packages.

e. Initial COIC are developed, approved, and included in the TEMP prior to MS B. As the program progresses they are updated as needed (particularly in response to the ORD update for MS C when a separate FRP DR is planned). The issues being based on the MNS will seldom change; however, the criteria will change as the operational requirement matures and in response to significant program restructures (for example, shifting of pre-planned product improvements or evolutionary acquisition increments). Criteria for the COIC applicable to the TEMP at MS B may be “soft” (that is, provide a performance standard but not a final performance threshold; for example, must have high probability of accomplishing mission X). Criteria will be “firm,” measurable performance thresholds for the COIC applicable to the TEMP at MS C and subsequent COIC updates. COIC updates required by program restructure/redirection between MS B and C (but not in response to the revised ORD preparatory to MS C) may continue to be “soft” if MS C is not the FRP decision for the program. These are in effect the MS B TEMP COIC.